

STRUTTURA	Scuola Politecnica - DICAM
ANNO ACCADEMICO	2015-16
CORSO DI LAUREA MAGISTRALE	Scienza e Ingegneria dei Materiali
INSEGNAMENTO	MATERIALI E PROCESSI PER L'INGEGNERIA TISSUTALE
TIPO DI ATTIVITÀ	Caratterizzante
AMBITO DISCIPLINARE	Discipline dell'Ingegneria
CODICE INSEGNAMENTO	17369
ARTICOLAZIONE IN MODULI	NO
NUMERO MODULI	1
SETTORI SCIENTIFICO DISCIPLINARI	Ing-Ind/22
DOCENTE RESPONSABILE	Vincenzo La Carrubba Professore Associato Università di Palermo
CFU	6
NUMERO DI ORE RISERVATE ALLO STUDIO PERSONALE	98
NUMERO DI ORE RISERVATE ALLE ATTIVITÀ DIDATTICHE ASSISTITE	52
PROPEDEUTICITÀ	
ANNO DI CORSO	II
SEDE DI SVOLGIMENTO DELLE LEZIONI	Consultare il sito politecnica.unipa.it
ORGANIZZAZIONE DELLA DIDATTICA	Lezioni frontali, Esercitazioni in aula, Esercitazioni in laboratorio
MODALITÀ DI FREQUENZA	Facoltativa
METODI DI VALUTAZIONE	Prova Scritta + Prova Orale
TIPO DI VALUTAZIONE	Voto in trentesimi
PERIODO DELLE LEZIONI	Consultare il sito politecnica.unipa.it
CALENDARIO DELLE ATTIVITÀ DIDATTICHE	Consultare il sito politecnica.unipa.it
ORARIO DI RICEVIMENTO DEGLI STUDENTI	Martedì e giovedì, ore 15-17

LEARNING OUTCOMES

Knowledge and understanding

Introducing the tissue engineering and regenerative medicine concept.

Define the key concepts of cell biology, bioengineering, histology and anatomy useful for understanding the tissue engineering and regenerative medicine paradigm.

Define properties and features of materials and processes used in tissue engineering.

Applying knowledge and understanding

Choosing the most appropriate processes and materials for a given tissue engineering application

Making judgements

Identifying the most important processes and materials for tissue engineering applications, highlighting differences, analogies, advantages and disadvantages in a comparative way

Communication skills

Studente should be able to communicate with competence and language skills about materials and

processes for tissue engineering applications, including mechanical properties, biodegradation, surface properties, porosity requirements.

Learning skills

Students should be able to assess with autonomy a basic tissue engineering problem, with the aim of define the solution strategies

LEARNING OBJECTIVES

1. Introduce the fundamentals of prosthetic systems and regenerative medicine
2. Define the main structural and functional properties of the materials used for regenerative medicine and tissue engineering
3. Scrutinize the main production processes of tissue engineering scaffolds and regenerative medicine devices
4. Selecting the most appropriate production process with respect to a well defined target

ORE FRONTALI	LEZIONI FRONTALI
2	The History of prosthetic devices, Tissue Engineering and Regenerative Medicine.
5	Introduction to cell biology and cell cultures: culture media, growth and differentiation, tissue formation. Cell-biomaterial interaction. Inflammatory and immunitary response.
4	Tissue Engineering and Regenerative Medicine paradigm: Goals and methods.
4	Scaffolds for tissue engineering. Strategies for the design.
5	Introduction to histology and anatomy: skin, cartilage, bone, cardiovascular system (blood vessels) and respiratory system (bronchial tube)
5	Materials used in tissue engineering applications: natural and synthetic polymers
5	Methods used in tissue engineering (scaffold production)
6	Methods for scaffold production based on phase separation: thermodynamics and kinetic implications
4	Biodegradation issues in tissue engineering: hydrolytic and enzymatic degradation. Biomimetic materials
	ESERCITAZIONI
12	Case studies of in-vitro tissue engineering: skin, blood vessels, bronchiole tube, bone
TESTI CONSIGLIATI	Articoli scientifici, Review e dispense fornite dal docente